

**ABSTRACT OF THE DISCLOSURE**

Solutions are provided that allow a network device to apply flow control on the MAC layer while taking into account the priority of the frame of traffic. This may be accomplished by generating a frame indicating that traffic flow should be paused, while utilizing a new opcode value, or alternatively by utilizing a new type/length value (possibly combined with a new opcode value). A receiving device may then examine the fields of the frame to determine whether it should use priority-based pausing, and then examine other fields to determine which priority-levels to pause and for how long. This allows for improved efficiency in flow control on the MAC layer.